

made to use the spectroscope with it, but without much success. The mounting is too weak and the driving-clock too defective for any employment of the Equatoreal upon such work with advantage. The aperture of the object-glass, seven inches, is small for such work upon faint objects.

18 The November meteors were carefully looked for, but very few were seen.

It is intended this year to observe the principal stars within the ecliptic limits for absolute right ascension—a point which has not previously received attention here. The changes of temperature between day and night are very considerable, and it has been thought necessary to protect the chief sidereal clock as far as possible against exposure to these changes. A change has, for this purpose, been prepared in the interior of the building where the changes of temperature from day to night are confined within a degree. The clock will stand upon a pier raised free from the walls and floors directly from the rocks below the building.

It is intended to repeat during the winter season the observation of the stars within  $5^{\circ}$  of the South Pole. Such observations are thought likely to be of value both for the determination of azimuthal errors in the Southern hemisphere, and also at some future period for an accurate determination of the constants connected with the motion of the polar axis by reference of its position to the mean of the group of stars rather than to one or two selected stars.

### *Sydney Observatory.*

Mr. Russell, who succeeded Mr. Smalley in the charge of this Observatory, read a report on the state and progress of the Observatory during the year 1870, at the Annual Visitation held on September 7, 1871. A few extracts from the Report are here given:—

"From the commencement of the year up to the time of his lamented death on the 12th of July, 1870, the late Astronomer had charge of the base-line operations at Lake George, in addition to the Observatory, and during that time all that his failing health allowed him to do was devoted to the base-line. Greater part of the Computer's time was also given to the examination of the instruments, measuring-bars, and other things connected with the same work. Little, therefore, could be done in the Observatory except the regular observations with the transit-instrument, the meteorological work and its regular reduction and publication, together with the examination and preparation of thirty sets of meteorological instruments for the new stations.

"The transit-instrument was in constant use, but not in good order; the dust, which got to the bearings in spite of close-fitting caps, cut into the soft pivots, and then they were made rough into the agate planes and removed the polish, so that the wear was

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very considerable (this has since been remedied and the instrument put in order). . . . In spite of every precaution most unsatisfactory jumps occur in the corrections of the transit, which can only be attributed to the quarrying, and especially the blasting, operations carried on near the Observatory. One person is removing stone from his own land, and has several times shaken the Observatory in such a way that no instruments could be expected to be accurate.

"I would strongly urge the advisability of getting a new transit-instrument, which shall be equal to the exact requirements of modern astronomy. With an instrument at the Cape of Good Hope equal to the Greenwich transit, and one almost equal at Melbourne, it seems a waste of energy to work with an instrument that was made more than thirty years since, and which never was a good one, even when new, either in plan or construction."

During the year 1870, 952 transits were observed, in addition to the usual observations for the instrumental adjustments, and 270 measures of the distance and angular position of double stars. Among the subjects of observation carried on in 1871, special attention was given to meridional observations of the Moon and Moon-culminating stars for the determination of the longitude, and to the measurement of distance and angle of position of as many circumpolar double stars as possible, and to the observation of the spectrum of a few of them.

#### NOTES ON SOME POINTS CONNECTED WITH THE PROGRESS OF ASTRONOMY DURING THE PAST YEAR.

The progress of Astronomy has been satisfactory during the last twelve months, as may be gathered from the various important subjects briefly alluded to in the following notes. The principal observatories have been steadily recording the results of their arduous and useful labours, storing up data for the future benefit of our science; while other observers, with less routine duties, have found time and zeal to discover several minor planets and comets, in addition to the usual amount of miscellaneous work. But perhaps the most important Astronomical observations during the year, and to which most attention has been given, were those of the Total Solar Eclipse of December 11 (Dec. 12, Civil reckoning), visible in Southern India, Ceylon, and Northern Australia. The generally successful results obtained in India and Ceylon, both with the spectroscope and by photography, will probably explain definitively many undecided points relating to the constitution of the Sun's chromosphere and corona.

#### *Total Solar Eclipse of Dec. 11 (Dec. 12, Civil Reckoning), 1871.*

In the last Annual Report will be found a summary of the observations of the Total Eclipse of December 1870. The bad